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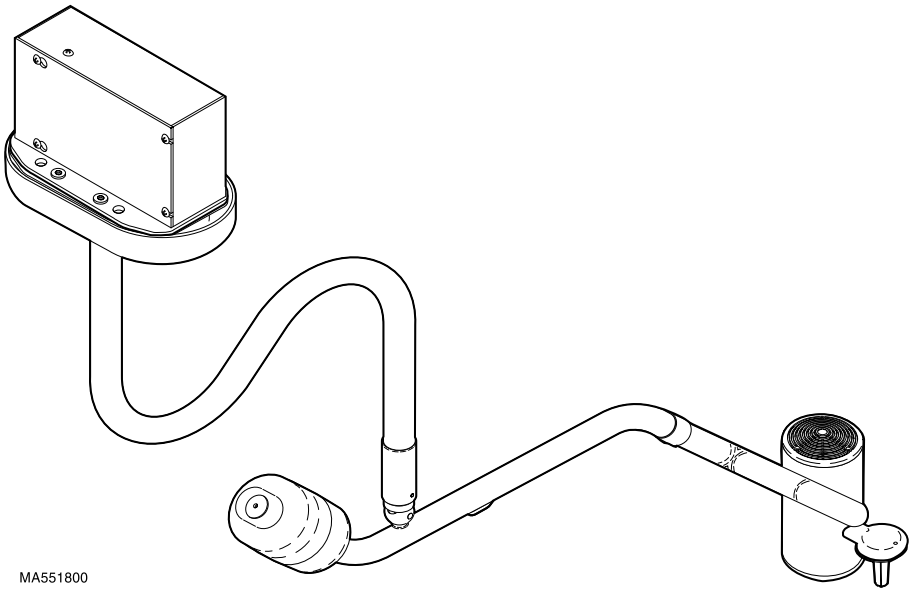
Operation Manual

354 Lighting System



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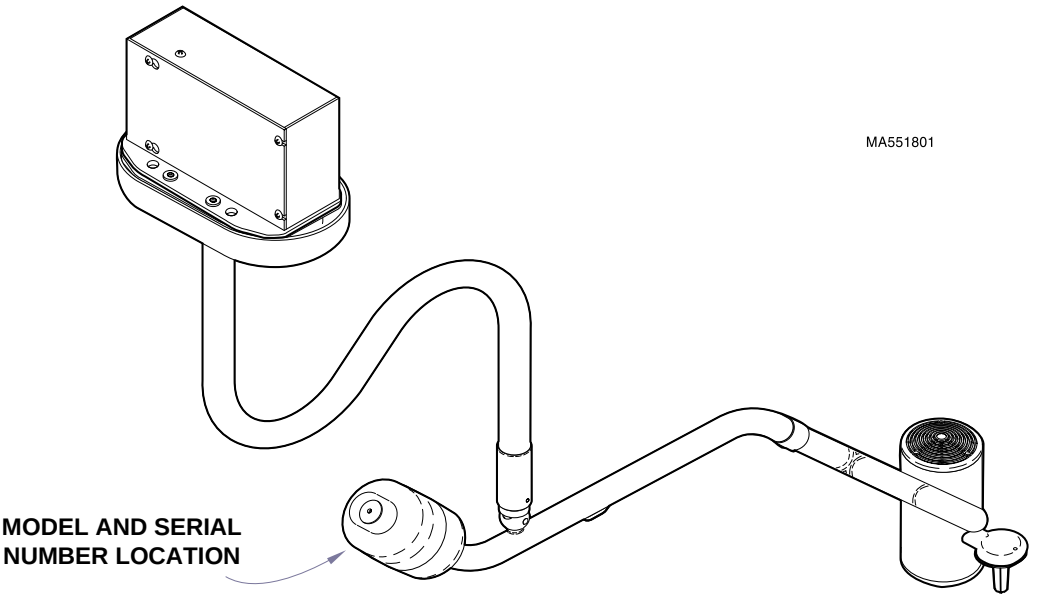
Owner's Product Identification

(information that you will need to provide for servicing - key information is highlighted)

Date of Purchase	***Serial Number***
Name of Owner / Facility / Department	***Model Number***
Name of Authorized Dealer	Telephone # of Authorized Dealer
Address of Authorized Dealer	



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IMPORTANT INFORMATION

Scope and Purpose of This Manual

This manual covers complete instructions for the operation of the 354 Lighting System and is intended to be used by medical personnel responsible for operating the 354 Lighting System during medical procedures or performing operator level maintenance. The installation manual is a separate document.

Intended Use of Product

This product is intended for use in all medical environments where illumination is required for external examinations and procedures.

Safety Instructions

The primary concern of Midmark is that this equipment is operated and maintained with the safety of the patient and staff in mind. To assure safer and more reliable operation:

- Read and understand this manual before attempting to install or operate the ceiling light system.
- Assure that appropriate personnel are informed on the contents of this manual; this is the responsibility of the purchaser.
- Assure that this manual is located near the ceiling light system.

Explanation of Safety Symbols and Notes

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. The DANGER symbol is limited to the most extreme situations.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

EQUIPMENT ALERT
Indicates an imminently or potentially hazardous situation which, if not avoided, will or may result in serious, moderate, or minor equipment damage.

NOTE
Amplifies an operating procedure, practice, or condition.

Indicates that the unit is rated: Type B, Applied Part.

Indicates that the operator's manual should be consulted for important information.

Indicates the presence of a dangerous voltage / shock hazard.

Indicates a fuse rating specification

Indicates a protective earth ground.

Indicates that the product is fragile; do not handle roughly.

Indicates the proper shipping orientation for the product.

Indicates that the product must be kept dry.

Indicates a hot surface.

Transportation and Storage Conditions

- Ambient Temperature Range:..... -22°F to +140°F (-30°C to +60°C)
- Relative Humidity..... 10% to 90% (non-condensing)
- Atmospheric Pressure ..... 0.5 bar to 1.06 bars (500hPa to 1060hPa)

This product contains glass, so it should be transported and stored with care to limit vibration and shocks.

DESCRIPTION

Introduction

Lighthead

The 354 lighthead assembly is a compact spotlight. The spotlight design provides excellent control over the diameter of the lighted area. Through the movement of two levers, the user has complete control over the light beam diameter between 3 in. (7.6 cm) to 10 in. (25.4 cm) and over the brightness of the lighted area. The peak illumination is 4,000 fc (43,000 lux) at a distance of 36 in. (91.4 cm). The plastic handle can be easily removed for sterilization or it accepts a Devon EZ Handle™ without requiring an awkward adapter. The arm assembly has been precisely designed, assembled, and balanced so that the lighthead

can be positioned with minimal force and no drifting will occur. In addition, multiple pivot points make the positioning of the lighthead easy and flexible.

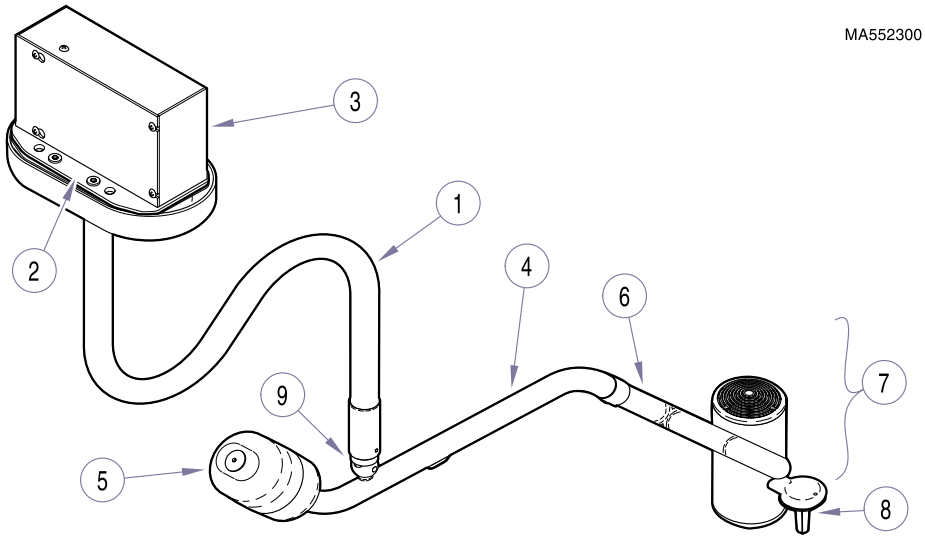
Features

The Model 354 lighting system . . .

- has a power supply with three input taps, allowing the voltage output to the light bulb to be adjusted according to the particular input voltage available at a facility. This prevents premature failure of the light bulb and lighthead components as well as unsatisfactory performance.
- has a peak illumination of 4,000 fc (43,000 lux) at 36 in. (91.4 cm), but can be adjusted to a lower intensity (brightness) if desired.
- provides a round beam of light which can be adjusted from a diameter of 3 in. to 10 in. (7.6 to 25.4 cm) - based on a distance of 36 in. (91.4 cm) from surface being lit.
- has two joint pivots with 580° of rotation, one pivot joint with 540° of rotation, and one pivot joint with 180° of rotation making positioning of the lighthead easy and flexible.
- has an arm reach of 48 in. (122 cm) (from centerline of down tube to center of lighthead).
- is precisely balanced so that the lighthead can be positioned with minimal force and no drifting will occur.
- has a plastic handle which can be easily removed for sterilization or it accepts a Devon EZ Handle™.

COMPONENTS OVERVIEW

The illustration below shows the location of the light system's major components and the chart below provides their descriptive name.

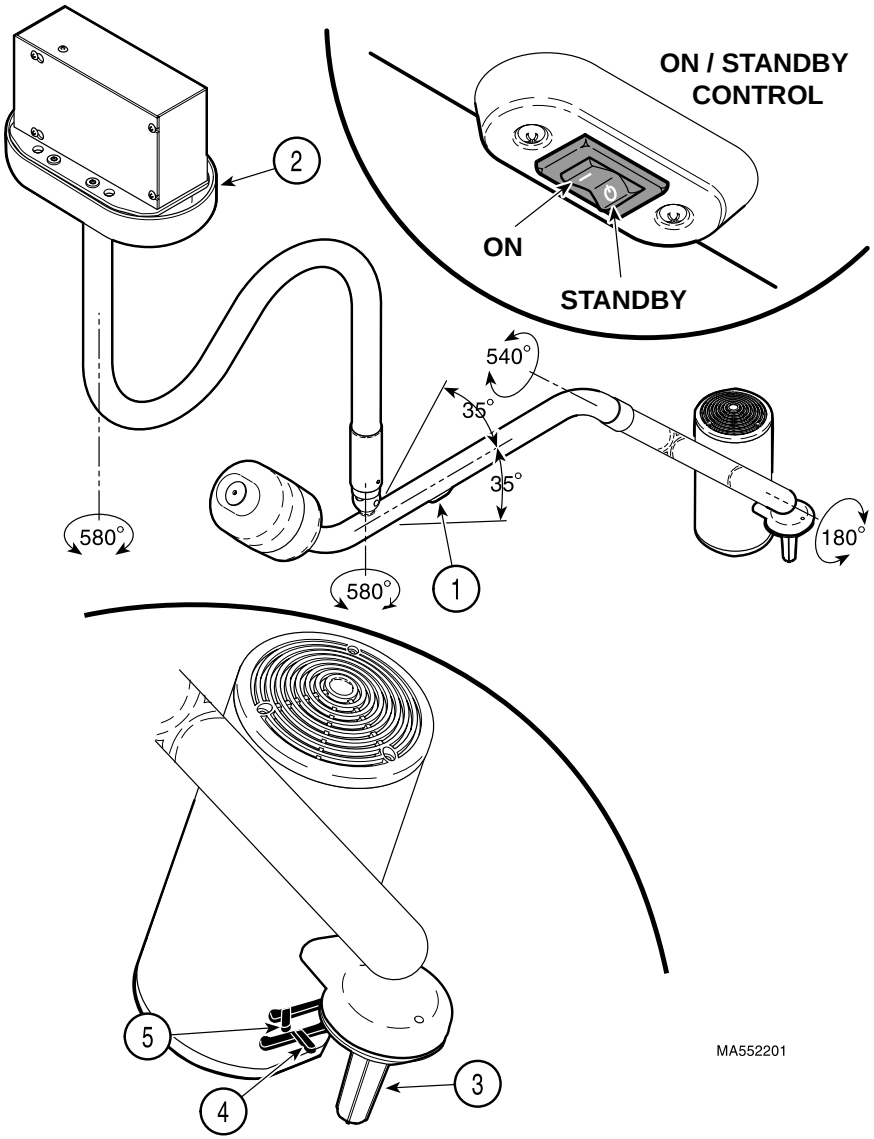


DESCRIPTION OF COMPONENTS

1. Down Tube Assembly	6. Lamp Tube Assembly
2. Ceiling Plate	7. Lighthead Assembly
3. Junction Box (includes transformer and fuse)	8. Positioning Handle (sterilizable)
4. Cross Tube Assembly	9. Ball Pivot Joint
5. Ballast Assembly	

CONTROLS & INDICATORS

The illustration below shows the location of the light system's controls and indicators and the chart below describes their function; the on / standby control for the light system is located on the underside of the cross tube assembly and a replaceable fuse is located on the underside of the ceiling plate, under the ceiling cover (see fuse replacement procedure later in this manual).



Ref.	Control	Function
1	*on / standby switch (indicated by international symbol for on / standby: I / ⏻*	*turns the light system on or off.*
2	*fuse holder*	*can be removed and inspected to determine if the fuse has been blown, indicating a current surge or problem with the light.*
3	*sterilizable positioning handle*	*allows sterile personnel to move the lighthead without compromising the sterility of their hands.*
4	*brightness control lever*	*used to adjust the brightness of the light beam.*
5	*beam size control lever*	*used to adjust the size (diameter) of the light beam.*

OPERATION

Electromagnetic Interference

This product is designed and built to minimize electromagnetic interference with other devices. However, if interference is noticed between another device and this product, remove the interfering device from the room or plug this product into an isolated circuit.

Operating Lighthead Assembly

EQUIPMENT ALERT
Do not obstruct the airflow of the lighthead or damage to lighthead could result. If the 354 light system malfunctions, immediately turn the ON / STANDBY switch to STANDBY "⏻".

Turn the lighthead on by switching the ON / STANDBY switch (I / ⏻) to ON "I" (See previous illustration). ***To adjust the position of the lighthead***, grasp the sterile handle (3) and rotate the arm assemblies and lighthead as necessary to obtain correct illumination on the patient (See previous illustration for amount of rotation for an axis). ***To turn off the lighthead***, switch the ON / STANDBY (I / ⏻) to STANDBY "⏻".

OPERATOR MAINTENANCE

Preventive Maintenance Schedule

The following preventive maintenance schedule should be followed. If a problem is detected, refer to the troubleshooting guide in this manual.

FREQUENCY	ACTIVITY
semiannually	Inspect rotation of lighthead. Make sure the lighthead rotates freely, without noise, and has 180° of rotation at lamp tube connection. Make sure the lighthead stays positioned at any point (without drifting) with respect to the lamp tube.
semiannually	Inspect the rotation of the lamp tube, cross tube, and down tube. Make sure the arm assemblies rotate freely and without noise. Make sure the arm assemblies don't drift at any point in their range of motion. The lamp tube should have 540° of rotation at cross tube connection. The cross tube should have 580° of rotation at down tube connection and should also have a vertical range of motion from -35° to +35°. The down tube should have 580° of rotation at ceiling mount connection.
semiannually	Turn light ON "I". Rotate lighthead, lamp tube, cross tube, and down tube while observing lighthead. The lighthead should not intermittently flicker or stop illuminating while joints are being rotated.
semiannually	Check for excessive joint rotation (more than 540° or 580° of rotation). The physical hard stops for an axis may be broken.
semiannually	Inspect inside of lighthead for indications of broken material or other signs of damage. **If damage to any part of lighthead is evident, do not continue to use lighthead.**
semiannually	Turn light ON "I". Verify that fan is operating. If fan is not operating, do not continue to use lighthead. Operating lighthead without a fan in operation may cause lenses to melt.

Troubleshooting Guide

If there is a malfunction with the light system, use the troubleshooting guide to correct the problem. Refer to the illustrations in the Components Overview and Controls & Indicators sections of this manual as necessary.

PROBLEM	POSSIBLE CAUSE	SOLUTION
no light from lighthead	*lighthead is on STANDBY "⏻ ".*	turn ON / STANDBY switch to ON "I"

no light from lighthead, but ON / STANDBY switch is ON "I"	*bulb has burned out*	refer to bulb replacement procedure in this manual
	fuse in junction box is blown	refer to the fuse replacement procedure in this manual
	no power to the junction box	call your building maintenance electrician to check for facility power to the junction box
	transformer is malfunctioning	call an authorized service technician
no light from lighthead although the bulb and fuse were checked; lighthead flashes intermittently when lighthead or arms are moved	*circuit or wiring problem within arm assemblies, junction box, or other part of lighting system*	call an authorized service technician
down tube, lamp tube, or lighthead does not rotate freely or drifts when released in desired position	*brakes need adjustment or improper installation of ceiling plate*	call an authorized service technician
cross tube rotates (at ball pivot joint) too stiffly or drifts when released in desired position	*tension needs to be adjusted or cross tube counterbalance needs to be adjusted*	refer to tension adjustment procedure in this manual. If proper tension cannot be achieved, call an authorized service technician

Bulb Replacement Procedure

CAUTION

Turn the ON / STANDBY switch to STANDBY "⏻" before replacing bulb. Otherwise, electrical shock or hand burns could result.

Move the lighthead as far as possible from the exam / surgical site to prevent contaminants from falling onto the exam / surgical site. Do not try to remove the bulb until the unit is allowed to cool. Otherwise, burns to the hands and fingers could result.

NOTE

Screw (1) is a captive screw. Only loosen captive screw; do not try to remove it.

The phillips head screw (1) is different from the other two screws on the top cap. Loosen this screw only to slide out the bulb carriage assembly (2); the two other screws secure the top cap to the fan mounting plate.

1. If light is on, turn the ON / STANDBY switch to STANDBY "⏻". Move lighthead away from exam / surgical site. Lower the lighthead to gain access for bulb removal.
2. Using a phillips head screwdriver, loosen one screw (1) and then slide bulb carriage (2) out of outer housing (3).

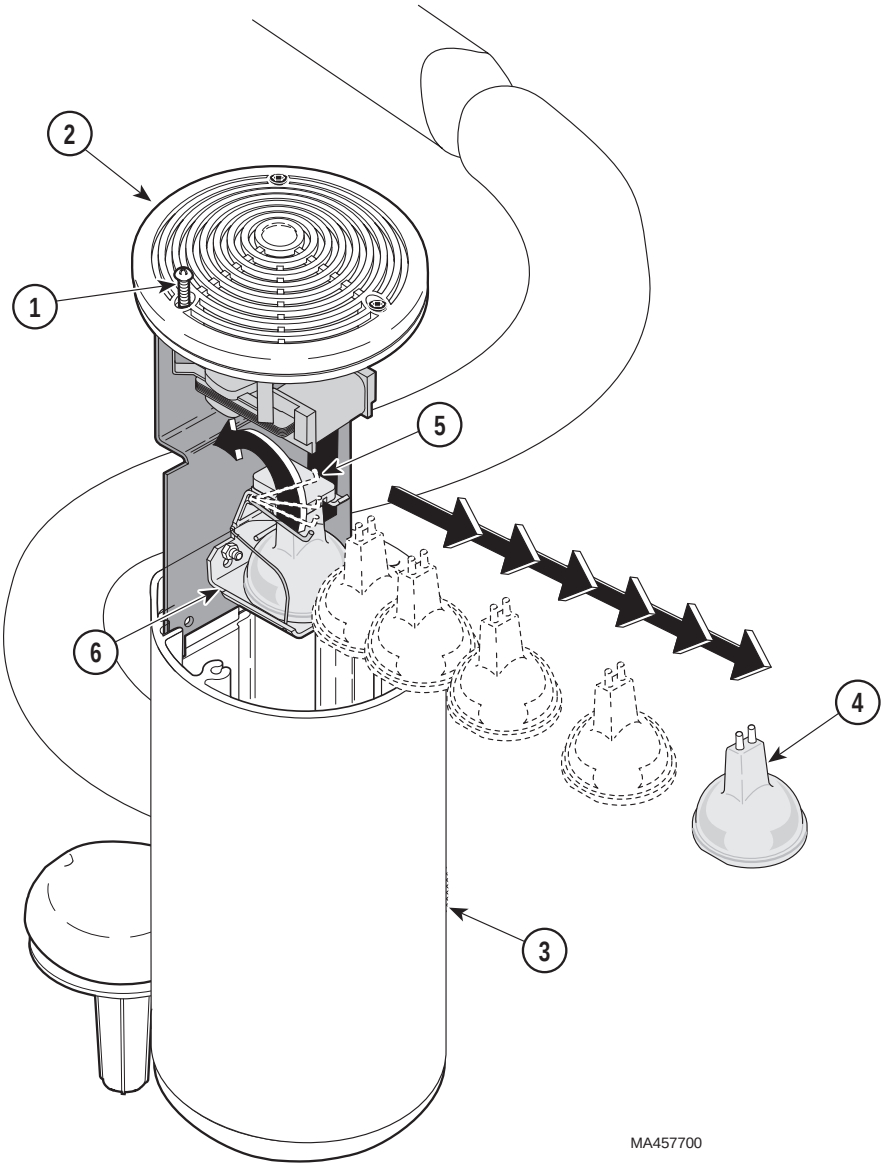
WARNING

The maximum allowable bulb wattage which can be used in this light is 150 Watts. There is a risk of fire if the 150 Watt limit is exceeded. Use Midmark Part Number: 015-1212-00.

NOTE

Halogen bulbs are sensitive to body oils. Be sure not to touch the inside surface of the reflector or glass capsule of the bulb during relamping or cleaning. Body oils create a hot spot on the bulb and may cause the bulb to burn out prematurely. If these portions of the bulb/reflector are handled, wipe with a clean, soft, lint free cloth. Wipe with alcohol and pat dry.

3. Remove the old bulb (4) by first pulling the bulb ejector lever (5) to the rear and then gently pulling upward on the bulb with the other hand.
4. Push the bulb ejector lever (5) forward.

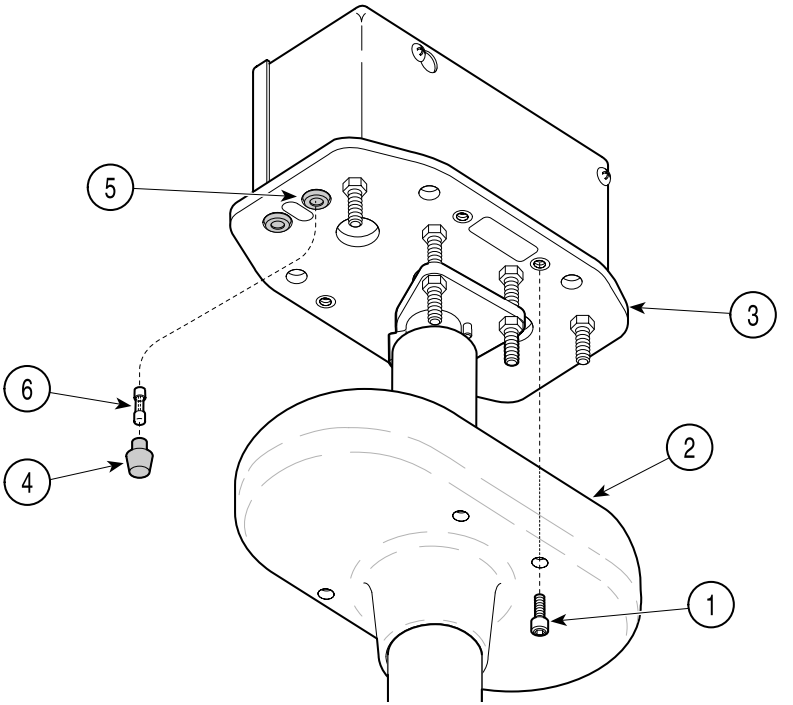


5. Grasp the new bulb (4) and insert the bulb into the bulb socket (6). Push the bulb all the way down until the base of the bulb is firmly seated against the bulb socket.

6. Slide bulb carriage assembly (2) into outer housing (3) and secure by tightening screw (1).

Fuse Replacement Procedure

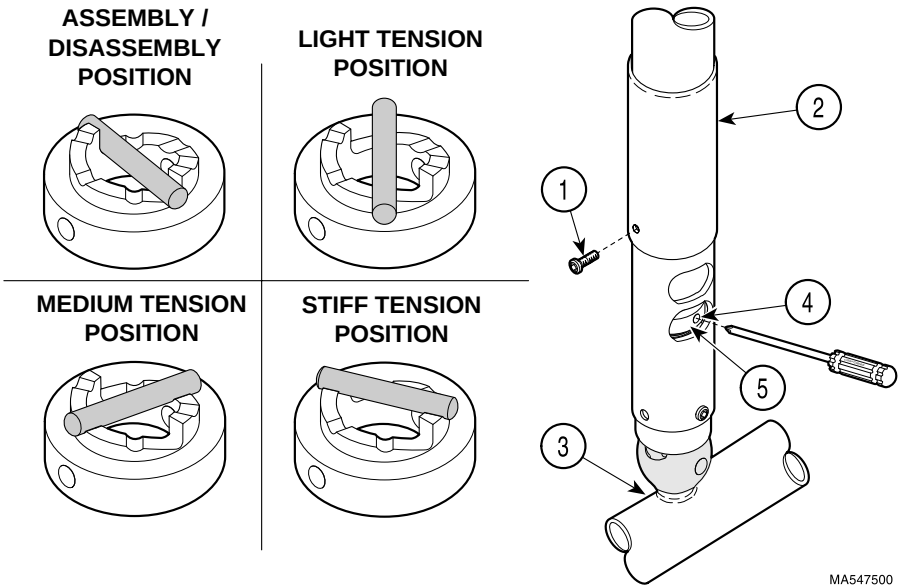
1. Turn the ON / STANDBY switch to STANDBY "⏻".



2. Remove four screws (1) and lower ceiling cover (2) from ceiling plate (3).
3. Simultaneously press in on fuse cap (4) with a slotted screwdriver and rotate it 1/4 turn in the counterclockwise direction; then pull fuse cap from fuse holder (5).
4. Pull fuse (6) out of fuse cap (4).
5. Inspect fuse (6) for any indication that it has been blown (opened); i.e. burnt look, discolored, fuse cord melted through, etc. Discard fuse.
6. Obtain a new fuse (6) of the same voltage rating, amperage rating, and type. Refer to the Specifications section in this manual.
7. Insert one end of the new fuse (6) into the fuse cap (4).
8. Insert fuse cap (4) into fuse holder (5) and rotate it 1/4 turn in the clockwise direction to secure it.
9. Position ceiling cover (2) on ceiling plate (3) and secure with four screws (1).

Ball Pivot Tension Adjustment Procedure

1. Remove screw (1) and slide ball pivot sleeve (2) up out of way.



2. Rotate cross tube (3) until adjustment hole (4) appears in the adjustment window opening.

NOTE
There are three settings which the ball pivot cam (5) can be set for: light tension, medium tension, or stiff tension. These settings may be changed according to the operator's preference.

3. Insert a phillips screwdriver into adjustment hole (4). Then, using the screwdriver, rotate ball pivot cam (5) to the desired tension setting.

4. Remove the screwdriver and move the cross tube (3) about the ball pivot joint in a circular motion and up and down motion to ensure the setting is the one desired. Move the cross tube (3) to a horizontal position and release it. The cross tube should not drift in any direction. If it does, a higher tension setting is required or the cross tube counterbalance needs adjusted (see counterbalance adjustment in the Installation or Service and Parts Manual). Repeat steps 3 and 4 until the desired tension adjustment is achieved with no drifting of the cross tube.

5. Slide ball pivot sleeve (2) down into position and secure with screw (1).

Cleaning and Disinfecting

EQUIPMENT ALERT

When cleaning or disinfecting the light, remove power from the light, allow optical unit to cool. Clean EXTERNAL SURFACES ONLY (arm assemblies and lighthead). Prevent fluids from leaking into interior or onto electrical contacts. DO NOT ATTEMPT to clean or disinfect interior; instead call an authorized dealer or service technician.

EQUIPMENT ALERT

Use only quaternary disinfectants to disinfect light. Staining, pitting, discoloration, or softening could occur if phenolic, iodophor, or glutaraldehyde-based disinfectant is used on plastic surfaces of the lighthead. Also, use of alcohol or aerosol spray cleaner / disinfectant containing substantial amounts of alcohol in the formula can damage the lens.

External Cleaning Procedures

For general cleaning, use a mild detergent and water solution. Wring excess solution from sponge or cloth before wiping.

According to your facility's procedure:

1. Clean lens with an antistatic acrylic cleaning solution using a soft, clean cloth. Do not use alcohol or abrasive compounds on lens.
2. Wipe external surface of arm assemblies and lighthead with a mild detergent and water solution.
3. Rinse all external surfaces with a soft cloth and clear water, wringing excess from cloth before wiping.
4. Wipe all external surfaces dry.

External Disinfecting Procedures

According to your facility's procedure:

1. Use only quaternary disinfectants to disinfect light. Staining, pitting, discoloration, or softening could occur if phenolic, iodophor, or glutaraldehyde-based disinfectant is used on plastic surfaces of the lighthead. Also, use of alcohol or aerosol spray cleaner / disinfectant containing substantial amounts of alcohol in the formula can damage the lens.
2. Wring excess solution from cloth.
3. Using soft cloth, wipe all external surfaces of arm assemblies and lighthead.

4. Do not rinse or dry external surfaces. Allow disinfectant solution to air dry.

Handle Sterilization

- Use only steam sterilization on the handle.
- Follow steam sterilization instructions of sterilizer manufacturer.

CALLING FOR SERVICE

If you are having a problem or have a question, refer to the inside front cover of this manual and call your dealer. Make sure that you have the information that is highlighted on the inside front cover of this manual available. If you can't resolve your question or problem with your dealer, call the following number:

1-800-Midmark (1-800-643-6275) or 937-526-3662
8:00 a.m until 5:00 p.m. (Eastern Standard Time in U.S.)
Monday through Friday, except for standard U.S. holidays.

SPECIFICATIONS

Model 354 Ceiling Light

Beam diameter @ 36 in.: ..... Variable from 3 to 10 in. (7.6 cm to 25.4 cm) **(91.4 cm)**
Bulb: ..... 21.0 VAC, 150 W halogen bulb
Color temperature: 4,200K
Focal length: ..... 36 in. (91.4 cm)
Illumination @ 36 in. (91.4 cm): ... 4000 fc (43,000 lux)
Electrical requirement: ..... 120 VAC, 60 HZ, 1.5 amps, single phase
Reach of arm assemblies: ..... 49.5 in. (126 cm) maximum from centerline of down tube to center of lighthead.
Rotation of lamp tube: ..... 180° rotation at lamp tube connection
Rotation of lamp tube: ..... 540° rotation at cross tube connection
Rotation of cross tube: ..... 580° rotation at down tube connection
Vertical range of cross tube: ..... -35° to +35° vertical movement
Rotation of down tube: ..... 580° rotation at ceiling plate connection
Weight of 8 ft. (2.44 m) single light assembly: ..... 59 lbs (26.8 kg)
Weight of 9 ft. (2.74 m) single light assembly: ..... 60 lbs (27.2 kg)
Weight of 8 ft. (2.44 m) dual light assembly: ..... 105 lbs (47.6 kg)
Weight of 9 ft. (2.74 m) dual light assembly: ..... 107 lbs (48.5 kg)

Certifications: ..... classified by Underwriters Laboratories Inc. with respect to electric shock, fire, and mechanical hazards only in accordance with UL2601-1 and CAN/CSA C22.2, No.601.1.
ISO-9001 Certified

Classifications: ..... Class 1, Type B applied part, Ordinary Equipment, Continuous Operation

Fuse Rating: ..... 1.6 amp, 250 VAC, 5mm x 20mm, Type T, low breaking capacity, IEC 127-2/3

Equipment not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide.

LIMITED WARRANTY

SCOPE OF WARRANTY

Midmark Corporation ("Midmark") warrants to the original purchaser its new Alternate Care products and components (except for components not warranted under "Exclusions") manufactured by Midmark to be free from defects in material and workmanship under normal use and service. Midmark's obligation under this warranty is limited to the repair or replacement, at Midmark's option, of the parts or the products the defects of which are reported to Midmark within the applicable warranty period and which, upon examination by Midmark, prove to be defective.

APPLICABLE WARRANTY PERIOD

The applicable warranty period, measured from the date of delivery to the original user, shall be one (1) year for all warranted products and components.

EXCLUSIONS

This warranty does not cover and Midmark shall not be liable for the following: (1) repairs and replacements because of misuse, abuse, negligence, alteration, accident, freight damage, or tampering; (2) products which are not installed, used, and properly cleaned as required in the Midmark "Installation" and or "Installation / Operation Manual for this applicable product. (3) products considered to be of a consumable nature; (4) accessories or parts not manufactured by Midmark; (5) charges by anyone for adjustments, repairs, replacement parts, installation, or other work performed upon or in connection with such products which is not expressly authorized in writing in advance by Midmark.

EXCLUSIVE REMEDY

Midmark's only obligation under this warranty is the repair or replacement of defective parts. Midmark shall not be liable for any direct, special, indirect, incidental, exemplary, or consequential damages or delay, including, but not limited to, damages for loss of profits or loss of use.

NO AUTHORIZATION
No person or firm is authorized to create for Midmark any other obligation or liability in connection with the products.

THIS WARRANTY IS MIDMARK'S ONLY WARRANTY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. MIDMARK MAKES NO IMPLIED WARRANTIES OF ANY KIND INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS.

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